



Resource Planning Process & 2016 Market Update

November 2016



Why do Resource Planning?

- To support the Austin Energy Strategic Plan
- To meet the objectives of the (ACPP) Austin Climate Protection Plan – net zero carbon emissions by 2050 (among other goals)
- To manage cost and risk of energy to our customers– Affordability goals and rate volatility
- Manage customer load with behind the meter programs such as rooftop solar, energy efficiency, demand response and Storage
- Other complimentary strategies and objectives such as those related to low income customers

What Resource Planning is not?
A way to supply power to our customers



Resource Planning at Austin Energy

- A process that includes a measured system of choices and milestones over time

Set general direction by policy consistent with Austin Climate Protection Plan (ACPP) – City Council with advice from Austin Energy and stakeholders

Establish future path and milestones through Generation Plan to support ACPP

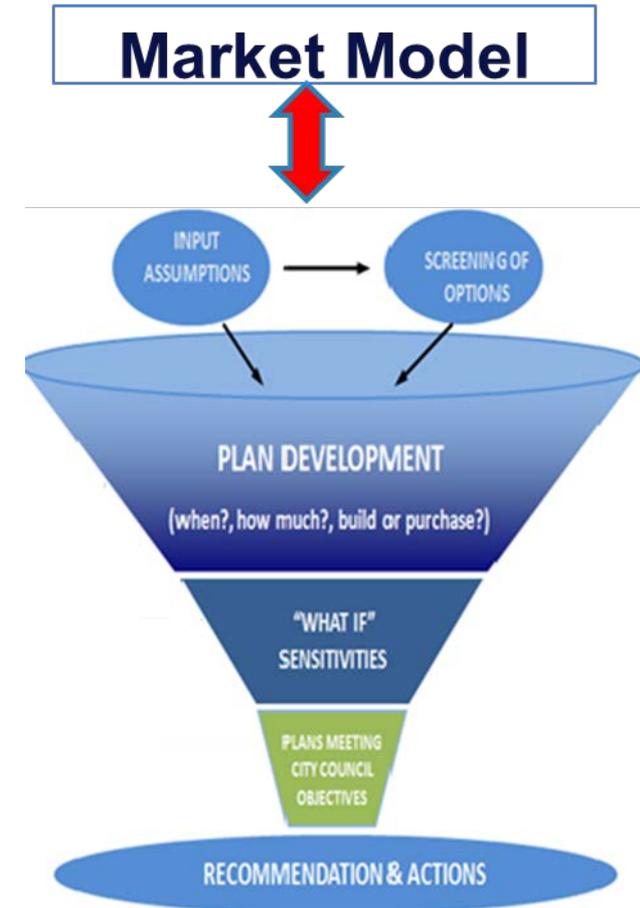
Pursue Generation Plan through budget, capital improvement plan, and financial strategies

Implement decisions through request for Council actions after competitive purchasing processes

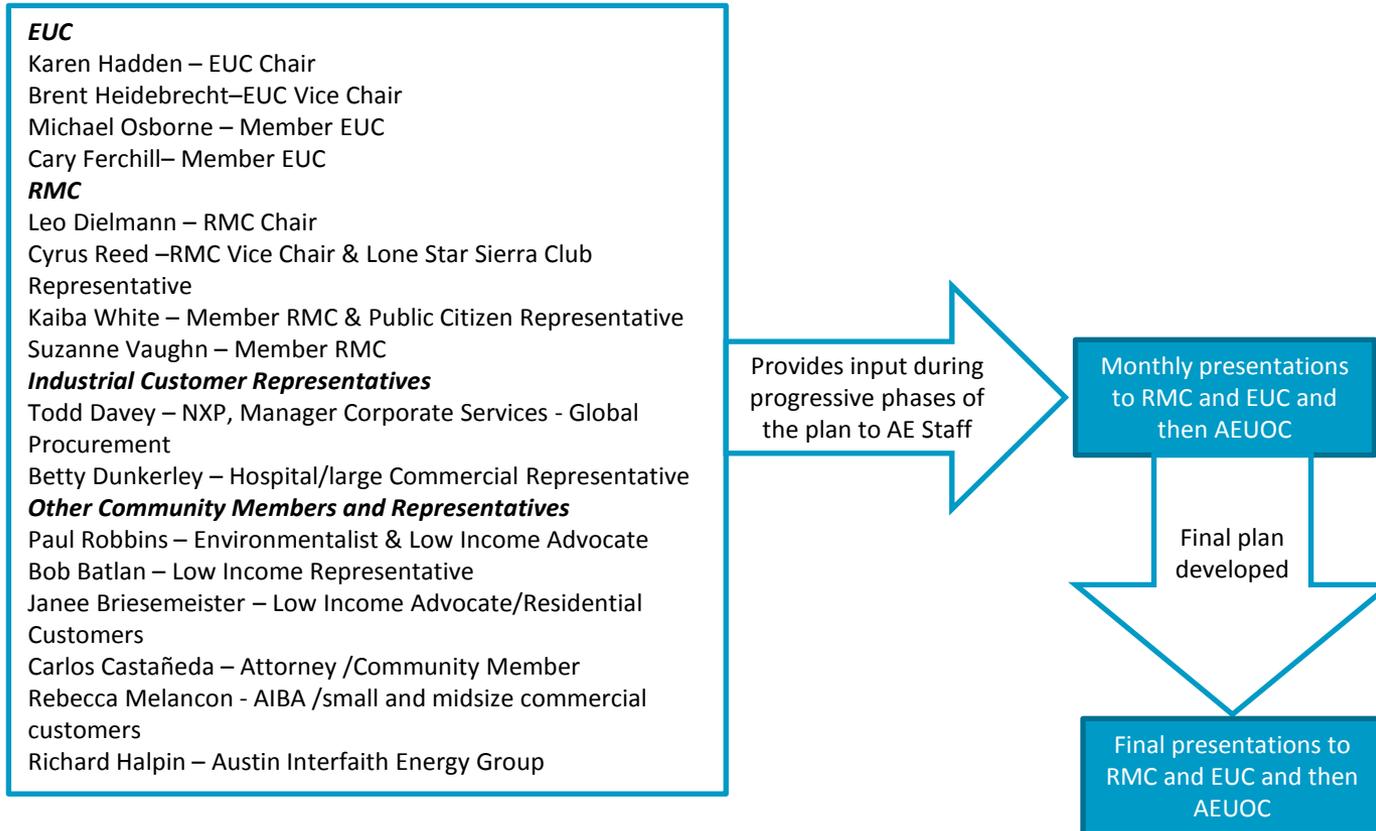
2-year updates to Resource Plan – allows for change in direction due to new inputs, market & regulatory forces, and stakeholder preferences

City Council will have numerous approval steps in implementing the approved resource plan

Resource Planning: It's a Process...

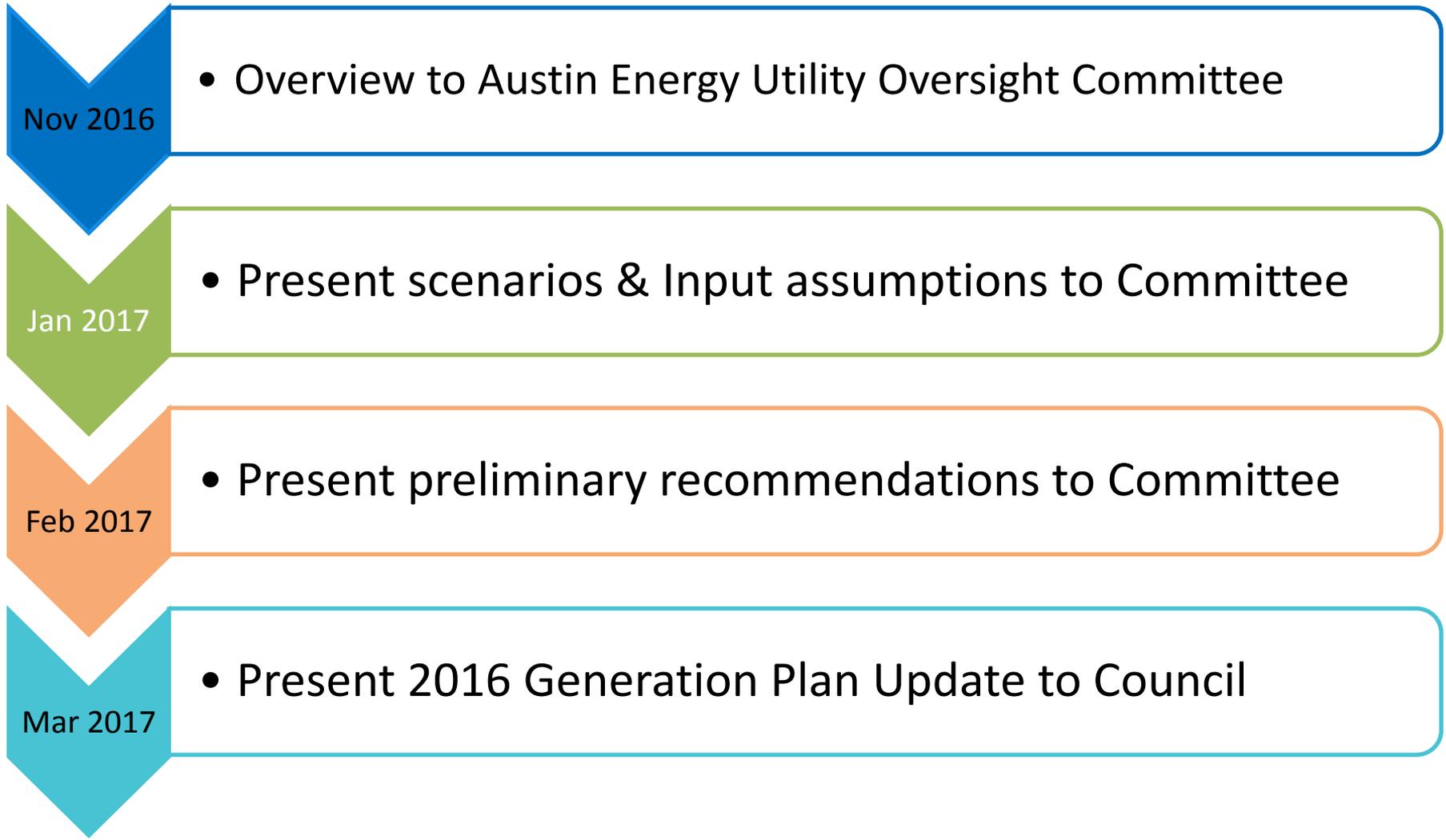


Resource Planning Stakeholder Group





Resource Planning Update Timeline

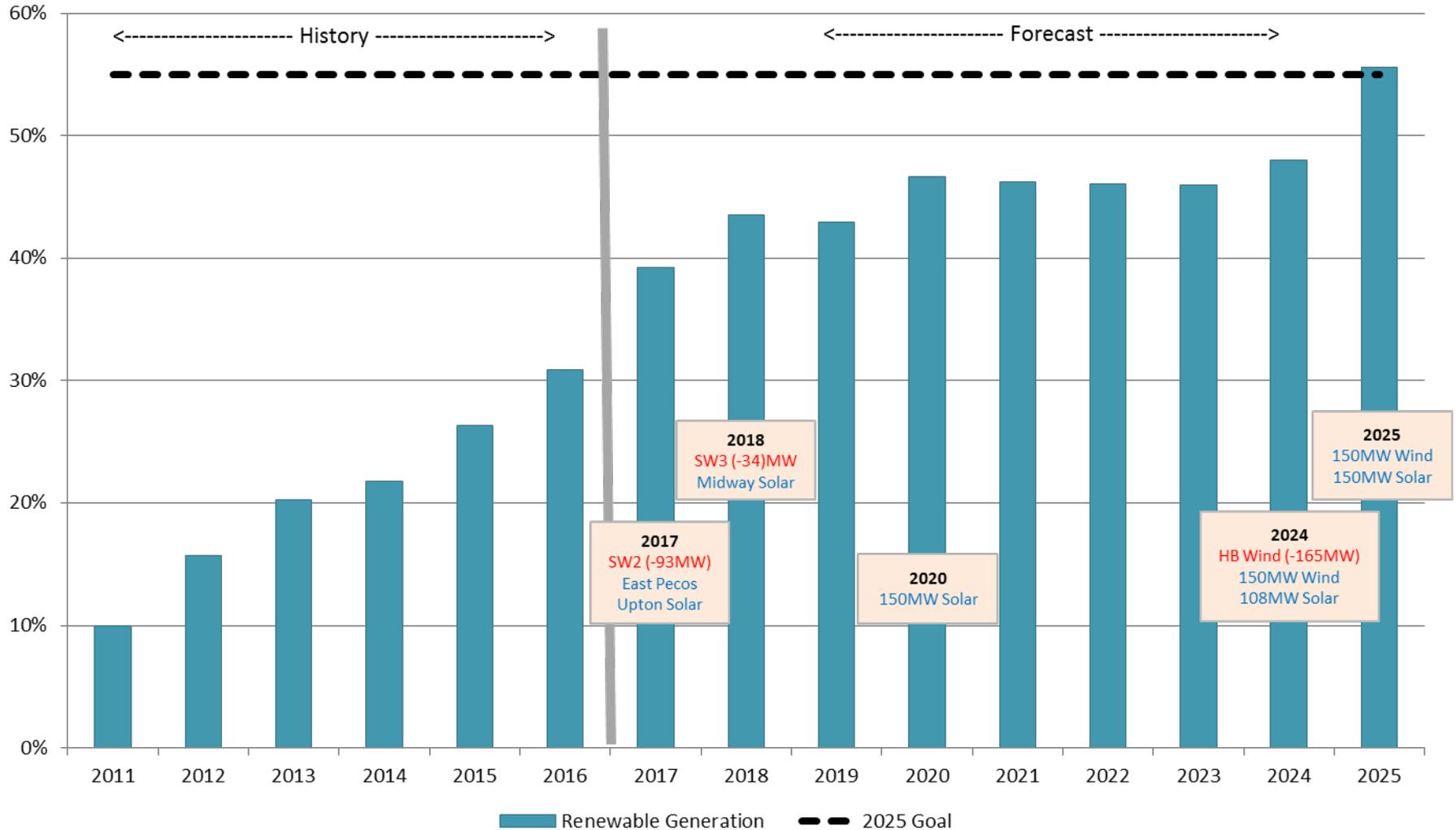


Recap of Goals & Directives from 2014 Update



- 2014 Austin Energy Resource Plan (Progress to date)
 - 55% renewables by 2025 (31%)
 - 900 MW Demand Side Management by 2025
 - 700 MW energy efficiency by 2020 (576MW)
 - Demand Response -100 MW by 2020 and additional 100 MW by 2025 (54MW)
 - 950 MW solar by 2025
 - 110 MW Local Solar by 2020 and additional 90 MW by 2025 if affordable (76MW)
 - 750 MW Utility Scale Solar by 2025 (180MWs Operational/450 under contract)
 - CO2 emissions
 - 20% reduction from 2005 levels by 2020 (meeting)
 - Retirement of Fayette Coal Plant beginning in 2023 (in progress)
 - Affordability
 - 2% limit per year (met)
 - Rates should be in the lower 50th percentile statewide (slightly above trending lower)
 - 10 MW (lithium ion batteries) local storage by 2025 + 20 MW of thermal storage (17MWt/3 MWe in progress)
 - Retire Decker steam units by 2019 and replace with 500 MW efficient combined-cycle (pending)– subject to a third party study (complete)

Renewable Generation to Date



Current Solar Portfolio



Contract Name	Type	Size (MW)	Start Date
Webberville	Utility	30	12/28/2011
East Pecos Solar	Utility	118	12/31/2016
Roserock Solar	Utility	157.5	11/16/2016
Upton Solar	Utility	150	8/31/2017
Kingsbery	Community	2.3	4/26/2017
Midway Solar	Utility	<u>170</u>	9/01/2018
Total		627.8	

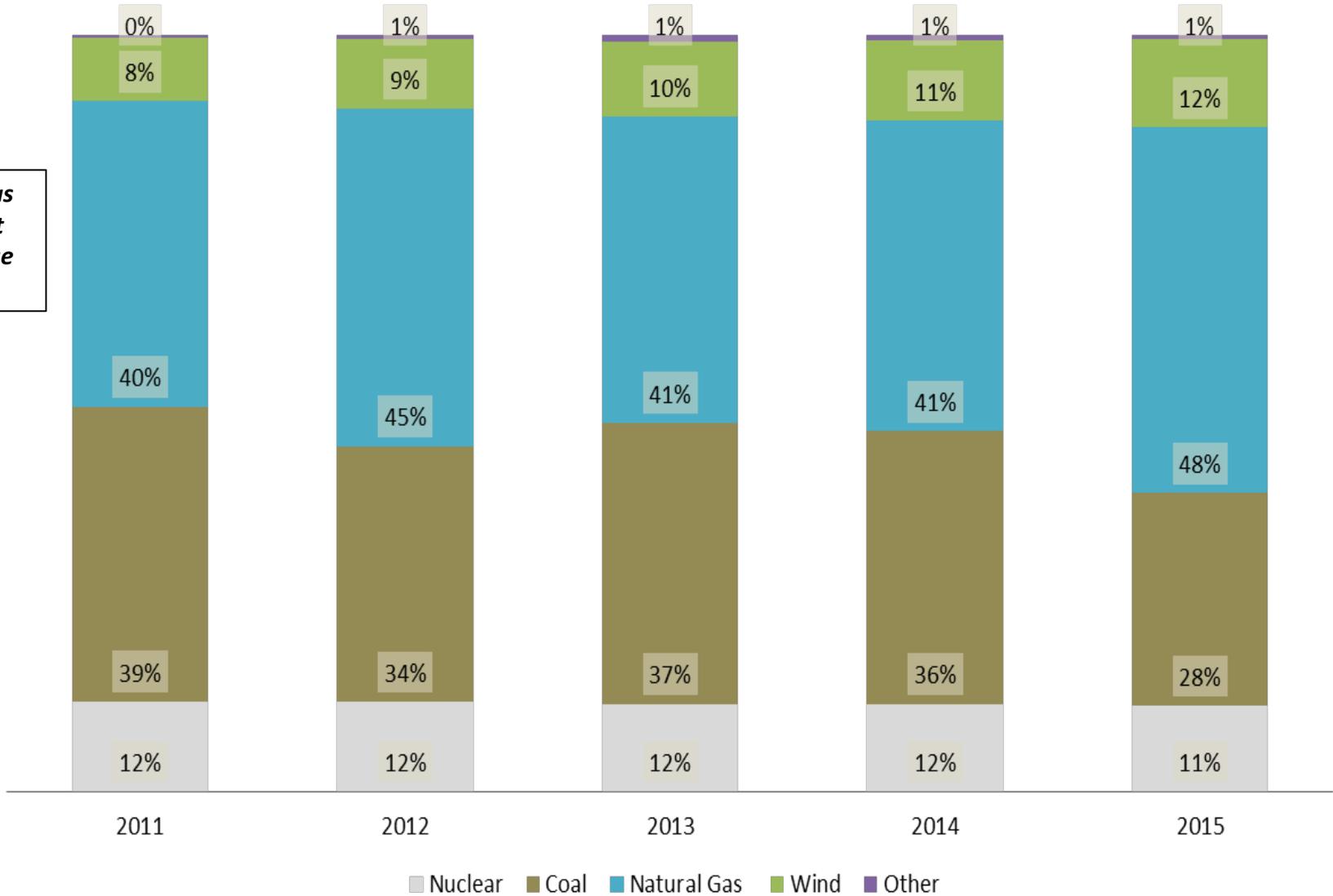


Market Update

Changes in ERCOT Generation Mix



Wind & Gas growing at the expense of Coal

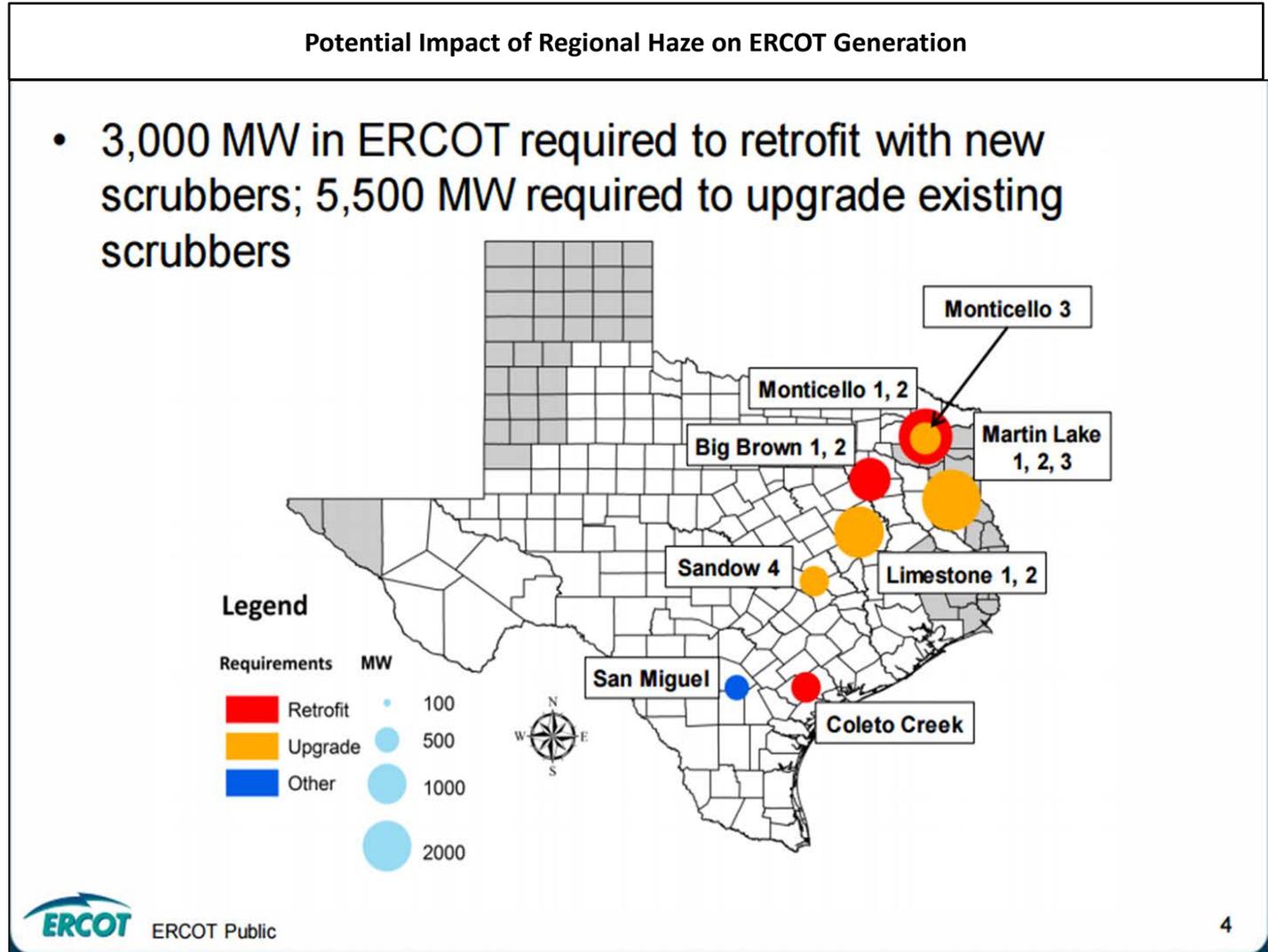


Changing Generation Landscape in ERCOT - Regulation



Regional Haze Rule has been stayed by 5th Circuit Court of Appeals

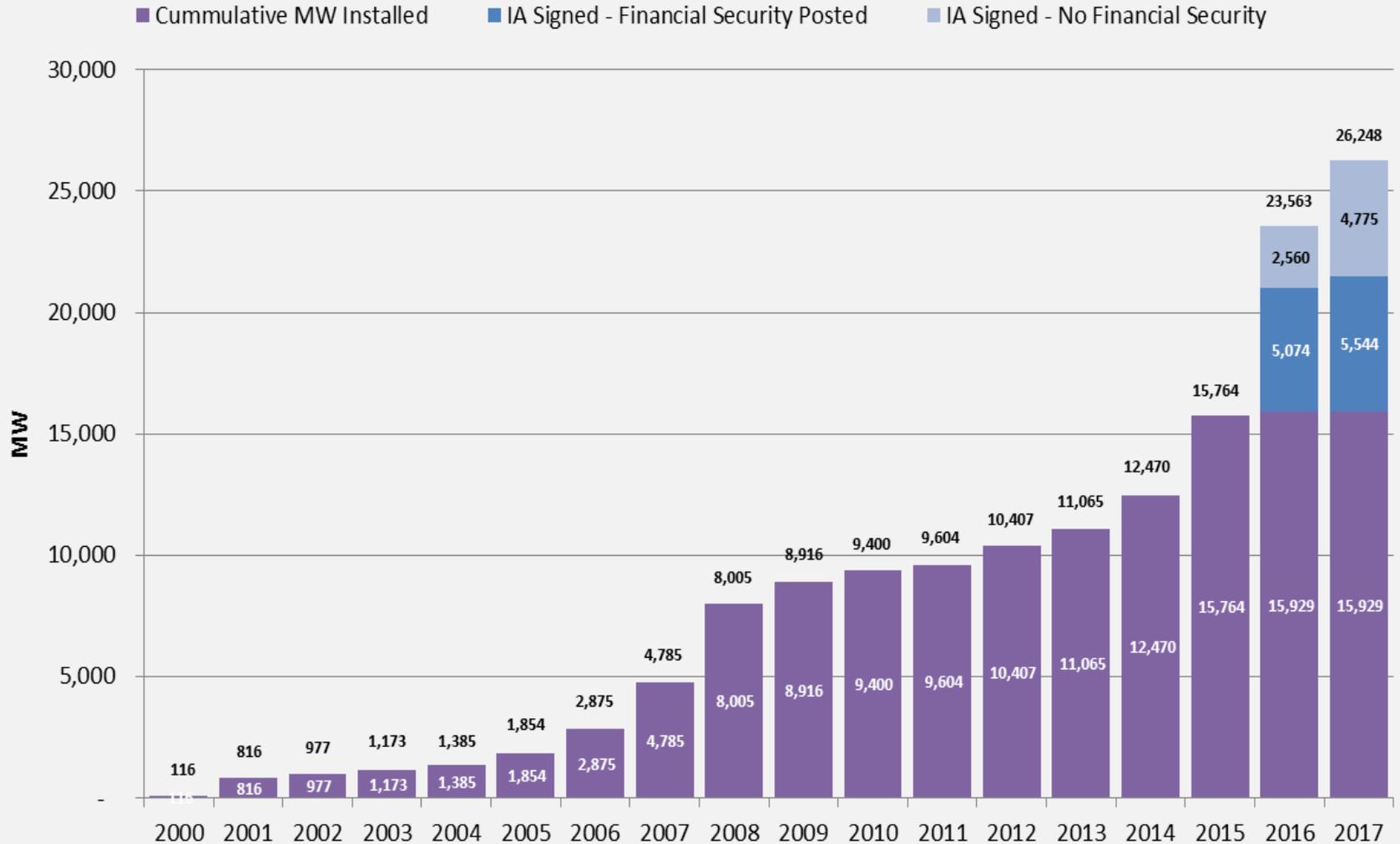
Texas haze plans have to wait until all regional haze court challenges conclude, if the regulation is not rejected outright.



Changing Generation Landscape in ERCOT - *Wind*



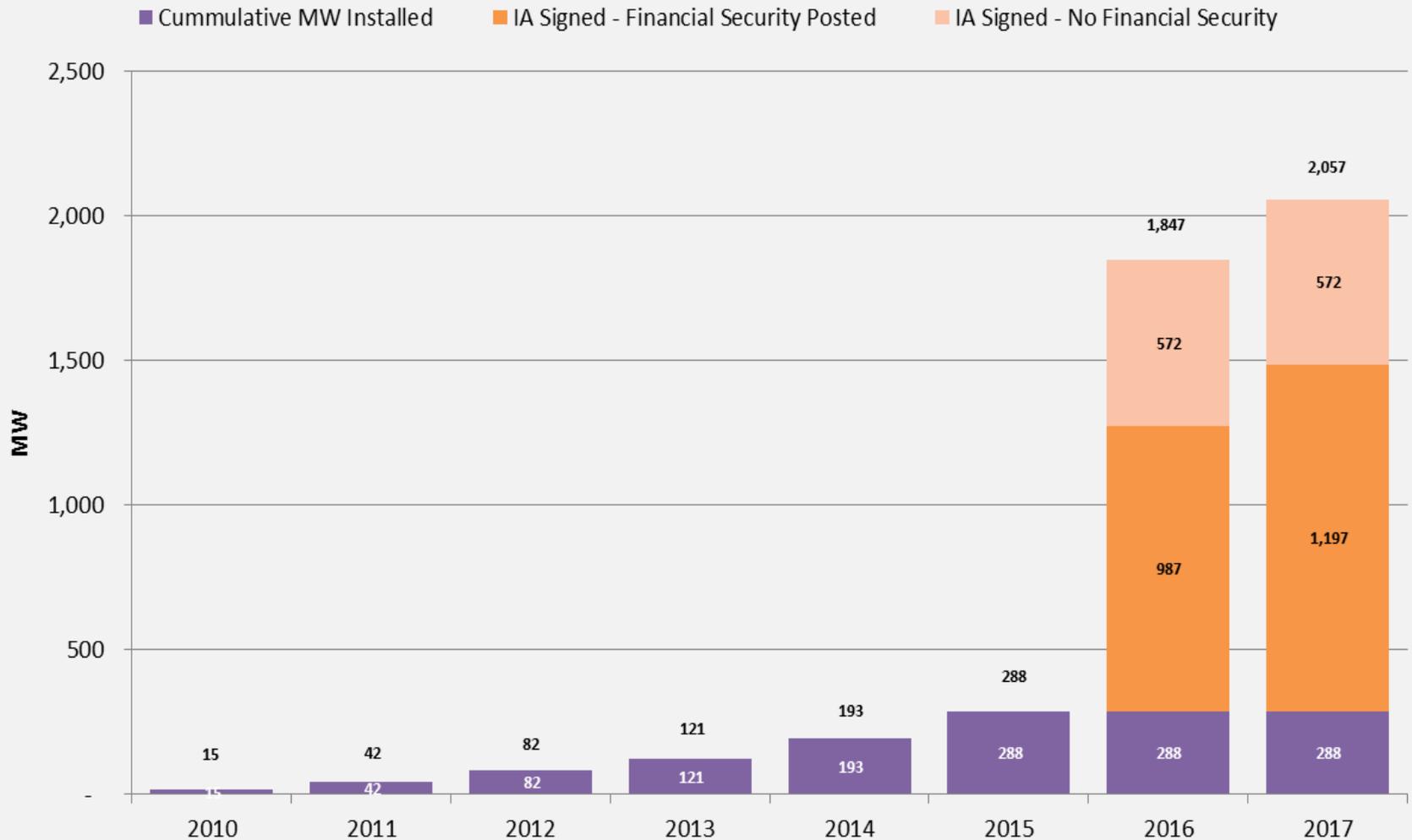
ERCOT Wind Installations by Year (as of January 2016)



Changing Generation Landscape in ERCOT - *Solar*



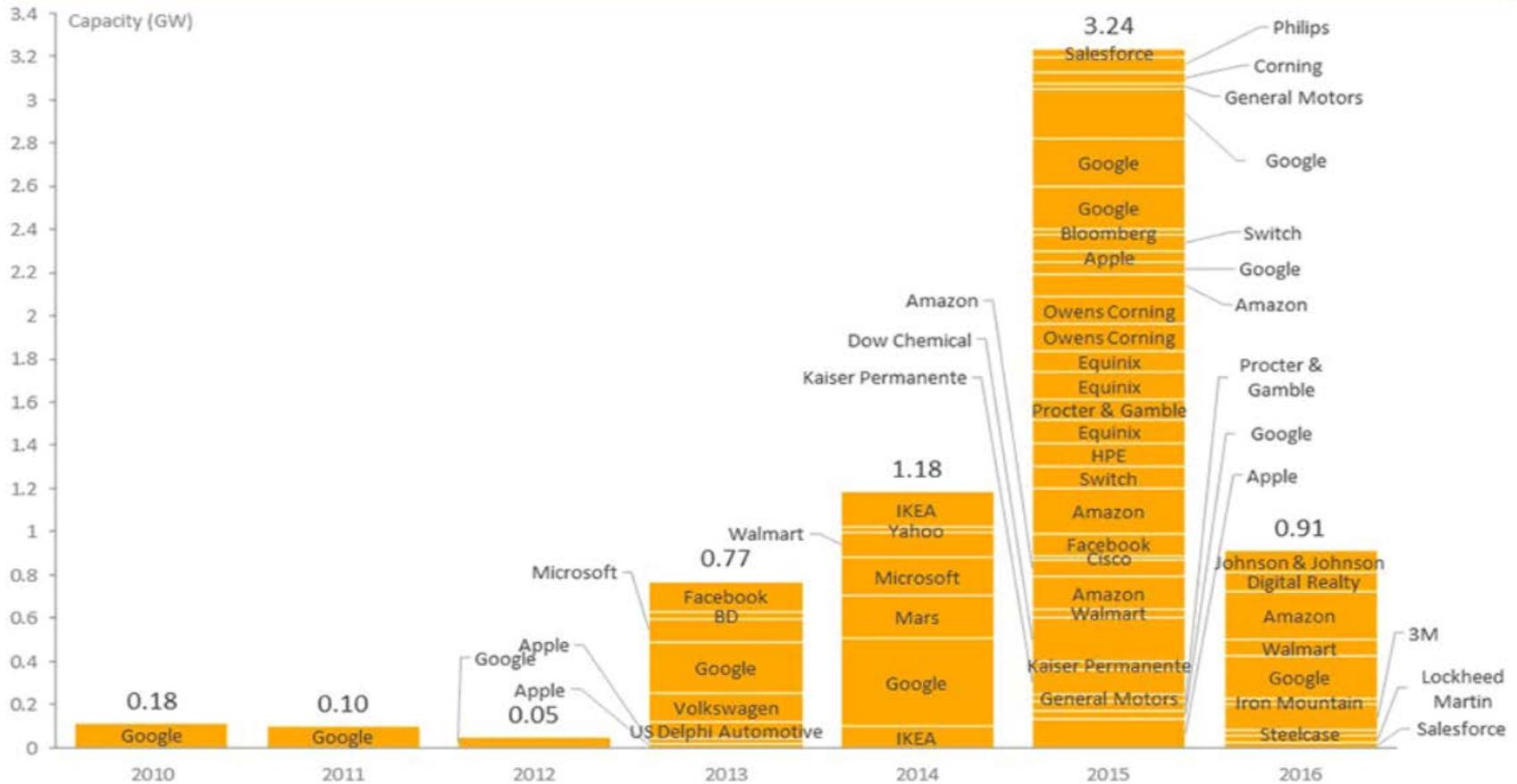
ERCOT Solar Installations by Year (as of January 2016)



What are the corporations doing with renewables?



Offsite corporate renewables



The gigawatt capacity of announced off-site corporate renewable power deals surged in 2015. Figures mostly reflect wind and solar transactions in the United States and Mexico. Graph courtesy of the Rocky Mountain Institute's Business Renewables Center.



Appendix



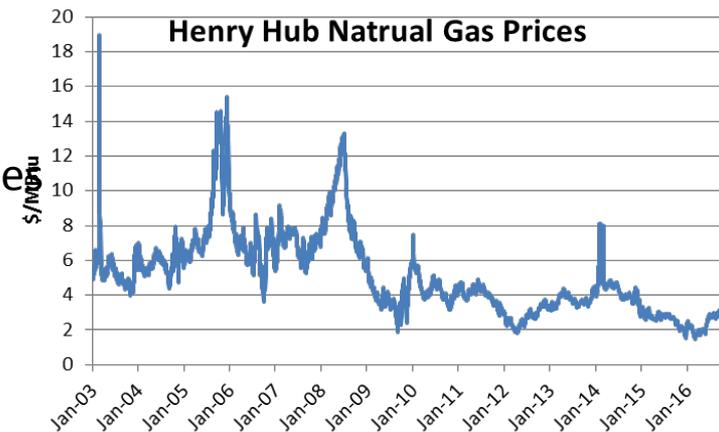
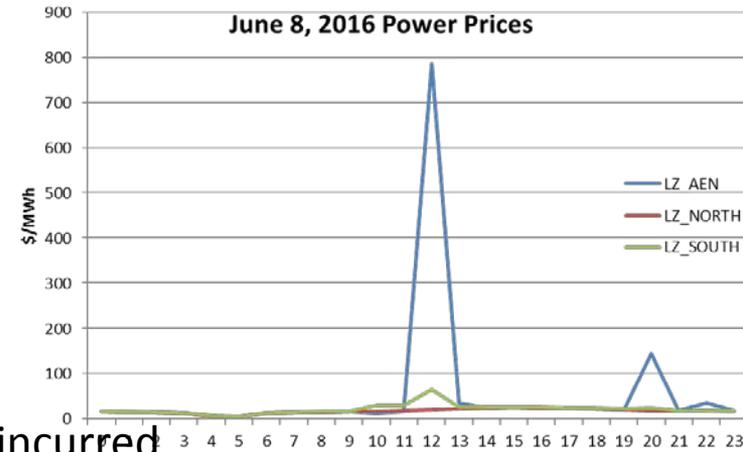
Austin Energy Methodology

- AE uses integrated modeling tools to simulate market data, AE's load and generation assets, financial data along with emission modeling to assess resource plans
 - Uses UPLAN simulation modeling well suited to ERCOT's market design, risk analysis using Monte Carlo techniques as well as one-off scenarios
 - Inputs include: cost of gas, coal, nuclear, oil, carbon, cost of new build of various technologies, fixed and variable O&M for ERCOT generation
 - Calculates cost & revenues of ERCOT assets and pricing at each node – 6,600 data output points
 - Results modeled for rate impact and financial metrics
 - This approach in line with industry practices, Brattle endorsed AE methodology in 2015
 - Well trained highly experienced economists

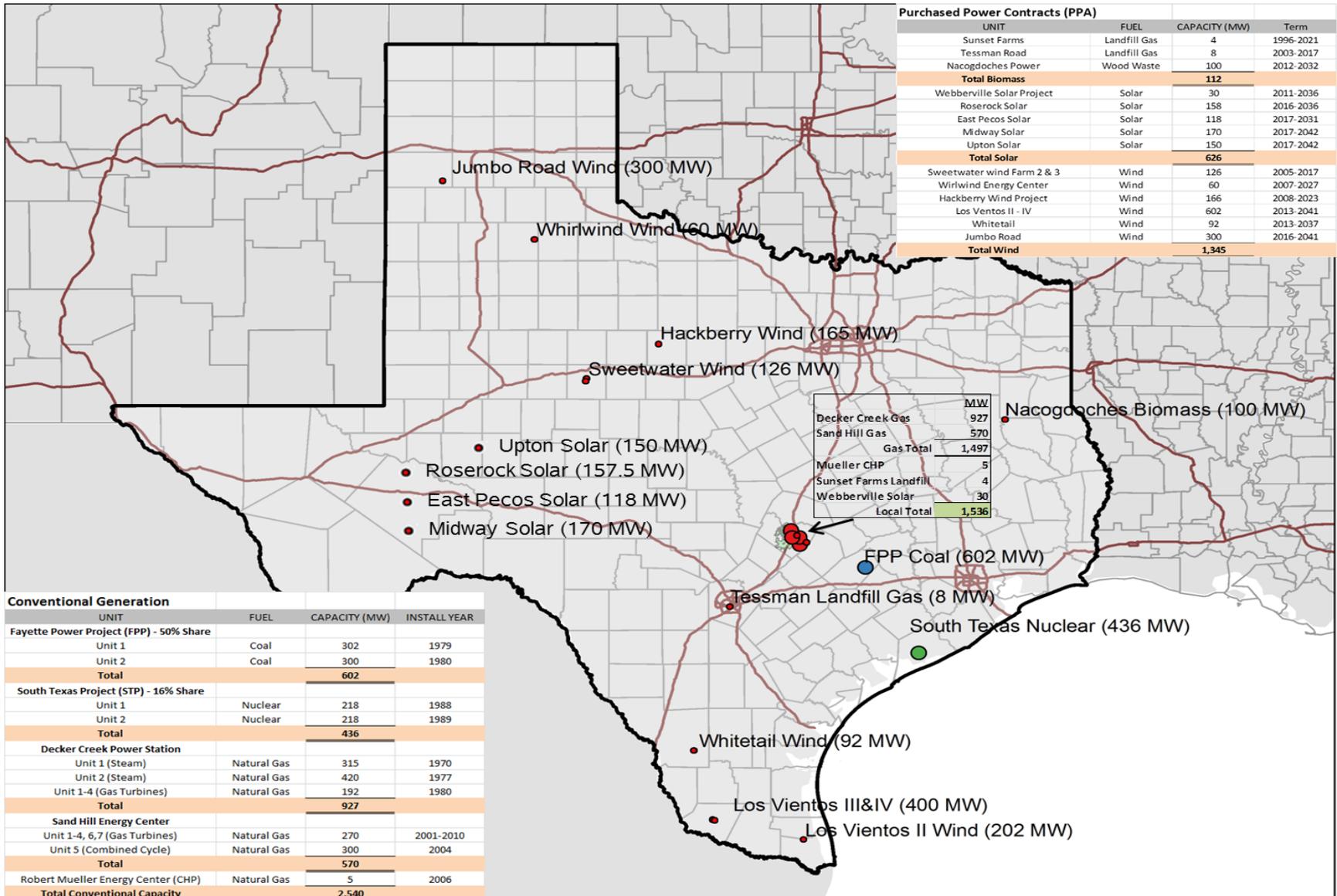
Key External Influences



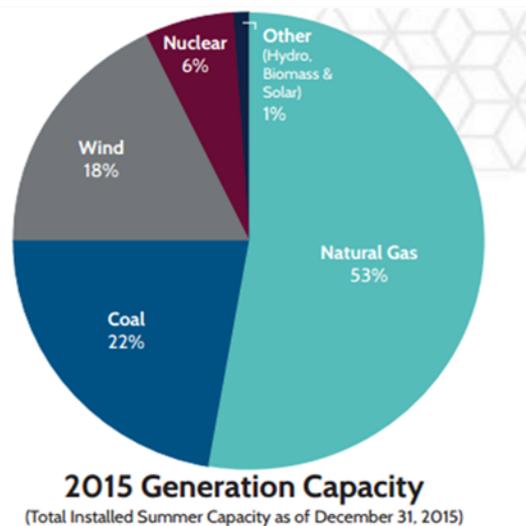
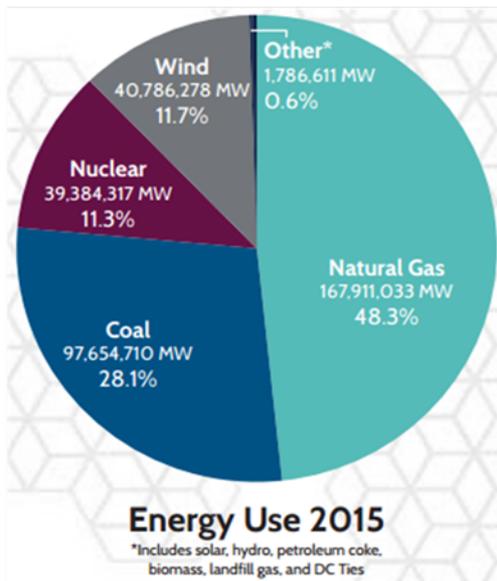
- Regulatory Uncertainties
 - Clean Power Plan
 - Mercury & Air Toxics Standards
 - Cross State Air Pollution Rule
- Electricity market design
- Market Conditions
 - Market cap \$9,000 /MWh
 - Congestion unique to Austin Energy
 - Energy payments due within a week of the date incurred
- Supply & Demand Portfolio
 - Seasonal and Hourly differences
 - Current and future AE and ERCOT demand
 - Current and future generation resource capabilities



Austin Energy Generation



The ERCOT System



At a glance

- About 90% of Texas load
- 24 million consumers
- Competitive-choice customers: 75% of load
 - More than 7 million electric-service ID's (premises)
- More than 46,500 circuit miles of high-voltage transmission
- More than 550 generating units
- More than 77,000 megawatts (MW) of expected available generation capacity for summer peak demand
 - One megawatt of electricity can power about 200 Texas homes during periods of peak demand.
- Record peak demand: 69,877 MW (Aug. 10, 2015)
- Energy used in 2015: 347 billion kilowatt-hours
 - Up 2.2 percent compared to 2014
- Market participants: More than 1,400 active entities that generate, move, buy, sell or use wholesale electricity

Solar and Wind Generation

- Nearly 16,000 MW of installed wind capacity
 - Most of any state in the nation
- Wind generation record: 14,023 MW (February 18, 2016)
- Wind penetration record: 45.14 percent (February 18, 2016)
- 288 MW of installed solar capacity